0716/000/039
1950
H

TREATMENT OF DUGOUT WATER FOR DOMESTIC USE

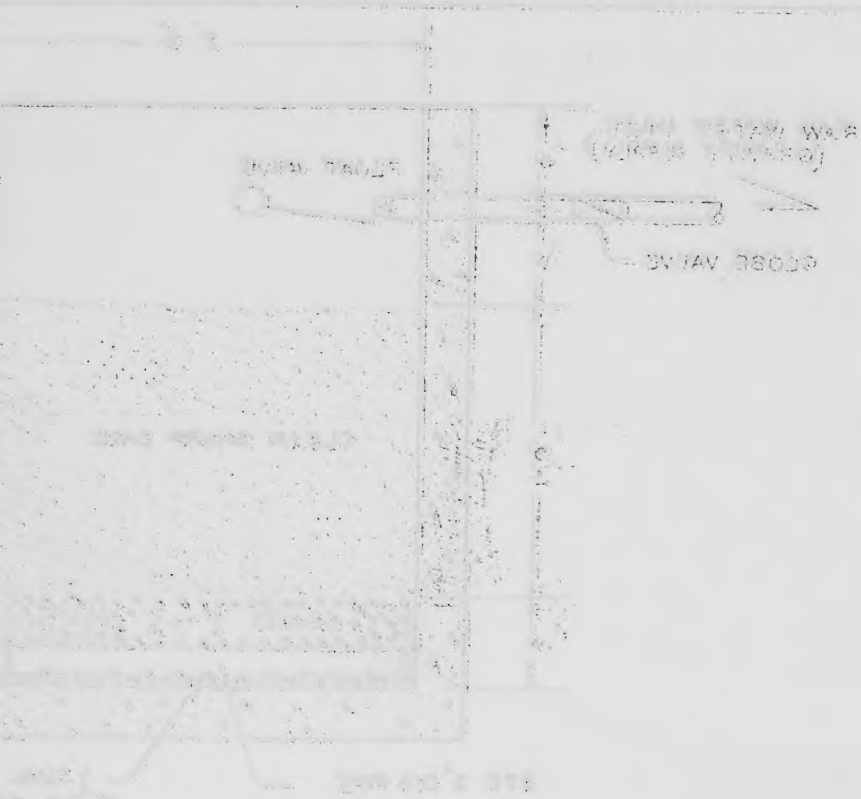
by

LIBRARY, ALBERTA AGRICULTURE
7000 - 113 STREET, EDMONTON
ALBERTA, CANADA T6H 5T6

H.D. Ayers

Agricultural Engineering Division,
Dominion Experimental Station,
Swift Current, Sask.

A.E. Publication #2 January, 1950.



TREATMENT OF DUGOUT WATER FOR DOMESTIC USE

H.D. Ayers*

There are large quantities of water available for domestic use as a result of the surface run-off produced by a rain or snow-melt in the prairie provinces. This water may be stored during periods of run-off for use throughout the year. This water is usually of the best quality for domestic use. With proper precautions, the quality may be maintained at a high level throughout the year.

Dugout Size and Drainage Area

The dugout should be of such a size as to hold sufficient water to ensure a continuous supply of good quality water throughout the year. A dugout 160 feet long by 60 feet wide by 12 feet deep will hold sufficient water for a year round supply for the use of the average household, in addition to 40 head of livestock. The drainage area should be large enough to ensure that the dugout is filled in at least 9 years out of 10. For further information regarding dugout or dam development, refer to "Instructions for the Development of Dugouts, Domestic Dams, and Irrigation Projects", by the Saskatchewan Department of Natural Resources, Regina.

Prevention of Contamination

The dugout should be tightly fenced to keep out domestic animals and fowl when the water is to be used in the household. In addition, the dugout should be situated and protected from possible contamination due to barnyard wastes. The drainage area itself should be kept reasonably free of animal wastes during the period prior to spring run-off.

Vegetation in the vicinity of the dugout may, in time, cause the dugout water to become hard or result in an iron accumulation. It is not advisable to grow evergreen trees closer than 50 to 100 feet from the edge of the dugout, while broad-leafed trees should be still further removed. Any other growth, which is likely to gather and decay in the dugout, should be cut short.

---

*Agricultural Engineer, Agricultural Engineering Division, Dominion Experimental Station, Swift Current, Sask.

Algae or small greenish organisms often impart an objectionable taste and odour to still water during the hot summer months. Copper sulphate (bluestone), applied to the dugout water at the rate of one pound for a full dugout of the size previously mentioned, will control these algae. Copper sulphate may be obtained from hardware stores. Copper sulphate may be applied by placing the required amount in a muslin bag and dragging it across the reservoir from side to side by means of ropes. This operation should be continued until the copper sulphate has been well distributed and completely dissolved in the water. Overdoses of copper sulphate will prove harmful to fish life or to humans.

Table I

RECOMMENDED DOSAGES OF COPPER SULPHATE (Pounds)

Top Dugout Dimensions (ft.)	Overall Depth (ft.)	Depth of Water in Dugout			
		Full	3/4	1/2	1/3
120 x 60	10	3/4	1/2	1/4	1/8
	12	3/4	1/2	1/4	1/8
	14	3/4	1/2	1/4	1/8
160 x 60	10	1	2/3	1/3	1/4
	12	1	2/3	1/3	1/4
	14	1	2/3	1/3	1/4
180 x 100	10	2	1 1/2	3/4	1/2
	12	2	1 1/2	3/4	1/2
	14	2	1 1/2	3/4	1/2

Dugout Filters

All water used for domestic purposes should be filtered. A simple economical type of filter is shown in Figure I. This type of filter will operate for long periods of time with a minimum of attention. The only disadvantage to this type is that the sand cannot be readily cleaned or replaced. However, it is not likely that this will be necessary oftener than once every 8 or 10 years.

As an alternate plan, Figure 2 indicates a type of filter that may be installed in the basement to filter rain water. This type of filter may be adapted to filter dugout water also, where the dugout is at a higher elevation than the filter, or where a raw water tank is located so that water will flow by gravity to the filter.

Water should be tested periodically for quality to ensure a safe dependable supply. Your Provincial Department of Public Health will do this analysis without charge. It is only necessary to write and ask for their special containers and directions for obtaining water samples.

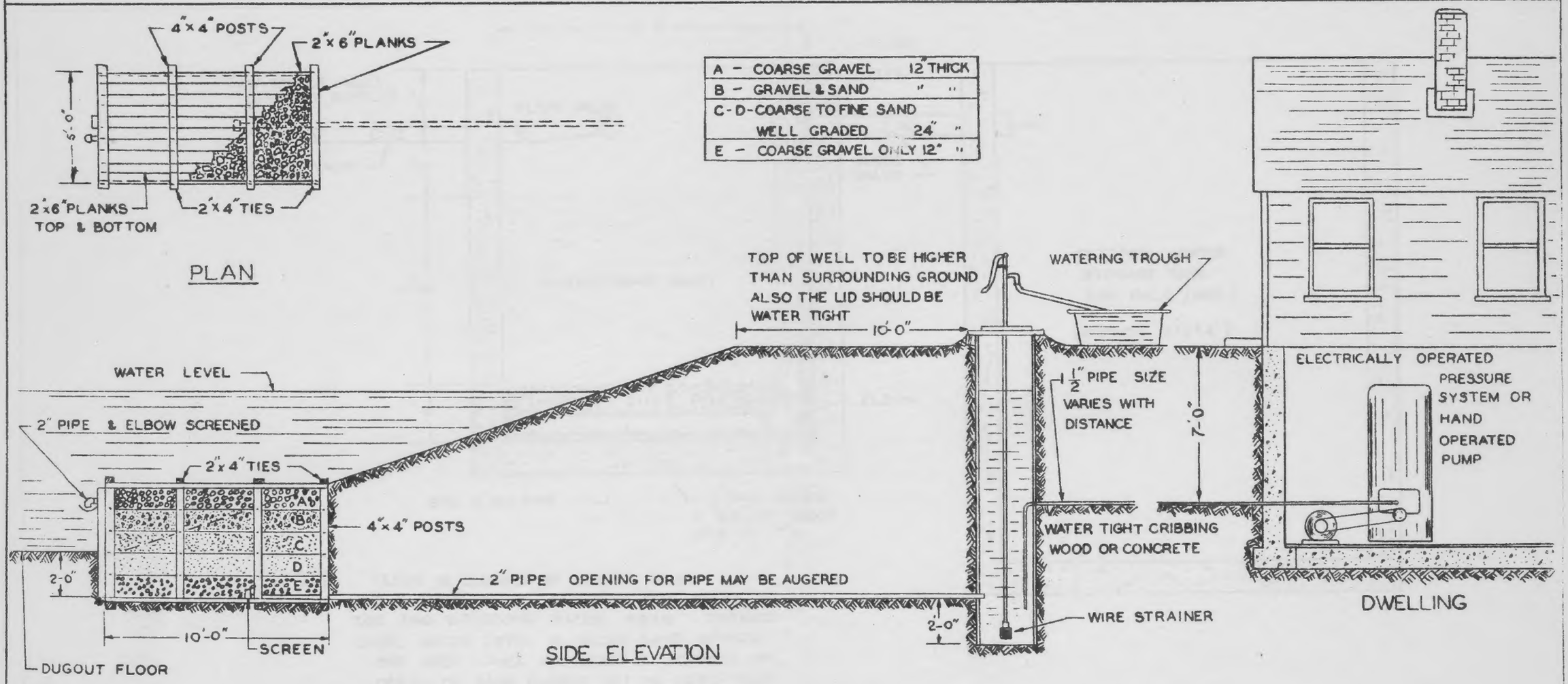
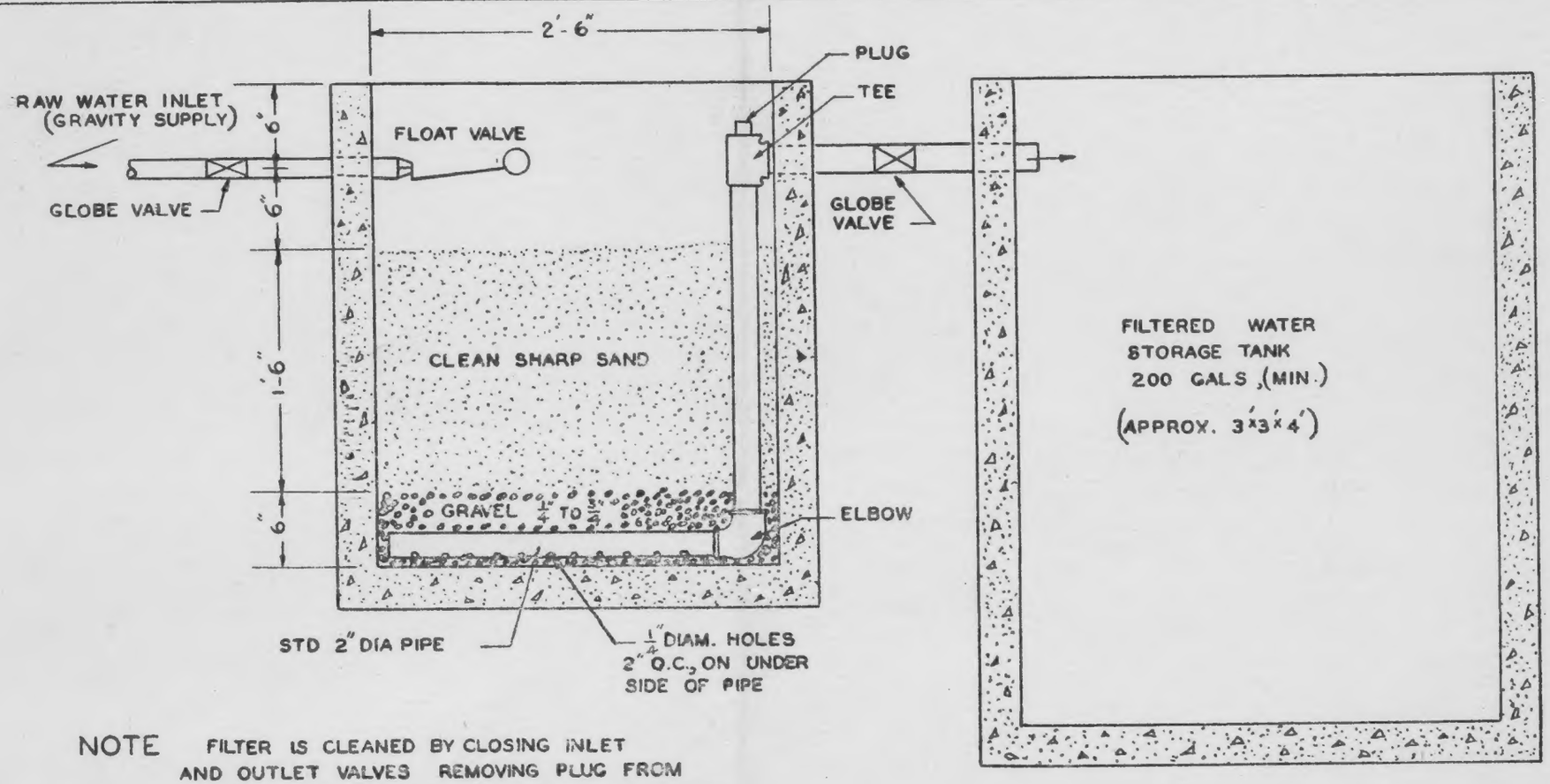


FIG. 1 DUGOUT FILTER

SCALE: 1 IN = 5 FT

A.E. 3.50/0//1



NOTE FILTER IS CLEANED BY CLOSING INLET AND OUTLET VALVES REMOVING PLUG FROM TEE AND SIPHONING WATER FROM OPENING UNTIL WATER LEVEL IS BELOW SAND SURFACE ONE INCH LAYER OF SAND IS SCRAPED OFF. DEPTH OF SAND SHOULD NOT BE LESS THAN 12 INCHES.

FIG. 2 GRAVITY FILTER

SCALE $\frac{3}{32}$" = 1"

A.E.3.50/0//2